



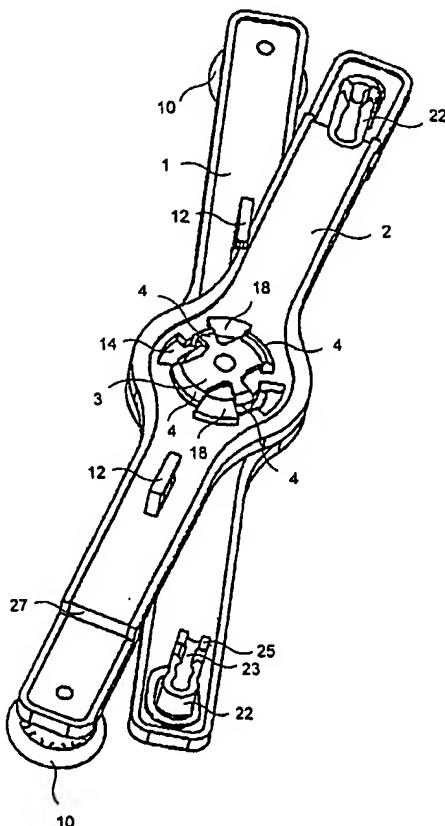
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 :  A47L 15/50	A1	(11) International Publication Number: WO 00/49936  (43) International Publication Date: 31 August 2000 (31.08.00)
(21) International Application Number: PCT/TR00/00009		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
(22) International Filing Date: 23 February 2000 (23.02.00)		
(30) Priority Data: 99/00442 26 February 1999 (26.02.99) TR		
(71) Applicants (for all designated States except US): ARÇELIK A.Ş [TR/TR]; Ar-ge Dept., E5 Ankara Asfaltı Üzeri, Tuzla, 81719 İstanbul (TR). SERDAR PLASTIK SANAYI VE TİCARET LTD. ŞTİ [TR/TR]; Organize Sanayi Bölgesi, Türkmenistan Cad. No.3, Sincan, 06500 Ankara (TR).		
(72) Inventors; and		Published
(75) Inventors/Applicants (for US only): BAŞTUJU, Cem [TR/TR]; Arçelik A.Ş., Bulaşık Makinasi İşletmesi, Altınorlu Caddesi No. 5, Organize Sanayi Bölgesi, 06500 Ankara (TR). TÜTEK, Serdar [TR/TR]; Serdar Plastik Sanayi ve Ticaret Ltd. Şti, Organize Sanayi Bölgesi Türkmenistan Cad., No.3, Sincan, 06500 Ankara (TR).		With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.
(74) Agent: ANKARA PATENT BUREAU LTD.; Sehit Adem Yavuz Sokak 8/22, Kızılay, 06440 Ankara (TR).		

## (54) Title: MECHANISM FOR ADJUSTING THE HEIGHT OF DISH BASKETS

## (57) Abstract

A cylindrical bearing (15) on a formed arm (2) is mounted to the straight arm movement bearing (17) in the straight arm (1). A spring (5) is positioned on the spring bearing (16) on a formed arm (2) and a locking button (6) is fitted to the lock (3) to keep the spring (5) at the middle. A basket connection shaft (22) is mounted to the basket connection shaft bearing (21) formed at the ends of the straight (1) and formed (2) arms and the mechanism is mounted to the basket connection wire (13) by means of the basket connection shaft (22). The spring (5), compressed between the spring bearing (16) and the locking button (6), applies force in the direction of locking the locking wedge (4) upon the engagement of the lock (3) to the locking button (6). The assembly of the mechanism is completed by fitting the basket connection shaft (22) into the basket connection shaft bearing (21) and mounting it on the basket connection wire (13). The mechanism arms (1 and 2) start to open while the basket (11) is raised upwards, the formed arm connection latch (18) rotates the locking wedge (4) and when the locking wedge (4) comes over the straight arm connection bearing (14) the mechanism is locked.



**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		

## MECHANISM FOR ADJUSTING THE HEIGHT OF DISH BASKETS

The present invention is related to a mechanism for adjusting the height of the dish baskets in the dishwashing machine in order to accomplish the adjustment 5 of the upper basket height vertically, when it is loaded, without requiring the basket to be taken out of the support system.

The dishwashing machines consist of a rail roller assembly, a guiderail moving between the rail roller assembly, rollers in the rails that are connected to 10 the upper basket and a rail cap serving as a stopper to prevent the upper basket from getting off the rail during usage. When modification in the height of the basket is desired, the user opens the rail cap and takes the dish basket off the rail, locates the other row of rollers of the upper basket on the rail and closes the rail cap. It is quite difficult to perform this procedure when the basket is loaded with 15 dishes; it can be made more easily after the basket is unloaded.

In the systems disclosed in German Patents Nos: DE 3004110 and DE 3025311, a basket height adjustment is made by using a quite costly mechanism that is mounted on both sides of the basket, which does not require the opening of 20 the rail cap, when the basket is loaded.

The object of the present invention is to provide the height adjustment of the upper basket in a dishwashing machine by using a single mechanism on both sides of the basket without taking the upper basket out of the machine.

25

The dish basket height adjusting mechanism realised in order to attain the object of the present invention is illustrated in the attached drawings, wherein:

Figure 1 - is the exploded view of the dish basket height adjusting 30 mechanism,

Figure 2a - is the bottom view of the mechanism in closed form,

Figure 2b – is the bottom view of the locking section of the mechanism in closed form,

Figure 3a – is the top view of the mechanism in closed form,

5 Figure 3b – is the top view of the locking button section of the mechanism in closed form,

Figure 4a – is the bottom view of the mechanism in open form,

Figure 4b - is the bottom view of the locking section of the mechanism in open form,

Figure 5a – is the top view of the mechanism in open form,

10 Figure 5b - is the top view of the locking button section of the mechanism in open form,

Figure 6 – is the view of the mechanism in closed form attached to the basket,

Figure 7 – is the view of the mechanism in open form attached to the basket,

15 Figure 8 - is the cross section view of the C-C line in Fig. 6, as the connection wire is connected to the basket connection shaft,

Figure 9a – is the cross section view of the A-A line in Fig. 2.,

Figure 9b – is the cross section view of the B-B line in Fig 4b.

20 The components shown in the drawings have been numerated as listed below:

(1) Straight arm

(2) Formed arm

25 (3) Lock

(4) Locking Wedge

(5) Locking Spring

(6) Locking Button

(7) Spring Support of Locking Button

30 (8) Fixing End

(9) Fixing End Locking Form

- (10)Roller
  - (11)Basket
  - (12)L-hook
  - (13)Basket Wire
  - 5 (14)Straight arm Connection Bearing
  - (15)Cylindirical Bearing
  - (16)Spring Bearing
  - (17)Straight Arm Movement Bearing
  - (18)Formed arm connection latch
  - 10 (19)Roller shaft
  - (20)Roller shaft claws
  - (21)Basket connection shaft bearing
  - (22)Basket connection shaft
  - (23)Basket connection wire bearing
  - 15 (24)Arm bearing
  - (25)Basket connection shaft claw
  - (26)Locking spring bearing
  - (27)Formed arm step
- 20 The basket height adjusting mechanism consists of the straight arm (1), formed arm (2), lock (3), spring (5), rollers (10), locking button (6) and basket connection shafts (22).
- 25 At one end of the straight arm (1) and at one end of the formed arm (2), there is a hollow roller shaft (19) with preferably right-angled projections. The rollers (10) are mounted on the shaft (19) with straight arm (1) and the formed arm (2) in such a manner that they move along the guide rails on the lateral walls of the dishwashing machine.
- 30 On the other ends of the straight (1) and formed (2) arms, there is an oval shaped basket connection shaft bearing (21) in which the basket connection shaft

(22) is mounted to provide the connection between the basket (11) and the mechanism. At the bottom of the structure formed so that the basket connection shaft (22) is mounted to the basket connection shaft bearing (21), basket connection wire bearing (23) provided for the passage of the basket wire (13) and 5 basket connection shaft claws (25) are arranged.

L-shaped hooks (12), formed as the ones on the straight (1) and formed (2) arms, facing to each other are provided to be hung to the basket, in order to avoid the torsion of the arms (1 and 2) due to excessive load.

10

The cylindrical bearing (15) on the formed arm (2) is mounted on the straight arm movement bearing (17) which is at the center of the straight arm. The rollers (10) are mounted on the roller shafts (19). After the spring (5) is mounted on the spring bearing (16) at the center of the formed arm (2), the locking button 15 (6) and the lock (3) are interlocked keeping the spring (5) at the middle. A fixing end locking form (9) is formed on the surfaces of the locking button (6) and the locking spring bearing (26) as recesses and projections engaging to each other. Straight arm connection bearing (14), wherein the locking wedge (4) can be inserted, are provided around the cylindrical bearing (15) on the formed arm (2) 20 (Figure 2b). The spring (5), compressed between the lock (3) and the locking button (6), gains initial tension and applies force in order to prevent the release of the lock (3) from the straight arm connection bearing (14). The assembly of the mechanism is completed by fitting the basket connection shaft (22) into the basket connection shaft bearing (21) that is at the end of the straight (1) and formed arm 25 (2). The mechanism is mounted to the basket (11) by means of the basket connection shaft (22). The L-hook (12) is hung on the basket wire.

When the basket (11) is at the lower position, in this position the mechanism is closed, the locking wedge (4) is not fitted into the straight arm connection 30 bearing (14). The spring (5) applies force to the straight arm connection bearing (14), in the direction of fitting (Fig. 2a and 2b). The mechanism arms (1 and 2)

start to open while the basket (11) is raised upwards. The formed arm connection latch (18) pushes and rotates the locking wedge (4). When the locking wedge (4) comes over the straight arm connection bearing (14), due to the spring (5) pulling in the locking wedge (4), it is fitted in the straight arm connection bearing (14) 5 (Figures 4a and 4b). So the locking button (6) connected to the locking wedge (4) moves forward (Figures 5a and 5b).

When the basket (11) is desired to be at a lower position, the locking button 10 (6) is pressed, the locking wedge (4) releases the straight arm connection bearing (14), and the mechanism closes due to the weight of the basket (11). During the vertical movement of the mechanism, the torsion of the mechanism attached to the basket wires is prevented by the L-hooks (12).

The basket adjusting mechanism is attachable on the basket connection wire 15 (13) provided on both sides of the basket (11). The mechanism, attached to the right side of the basket (11) can be rotated and attached to its left side. Thus, a single basket adjusting mechanism can be used without right or left differentiation.

20 In the preferred embodiment, the roller moving along the guide rails of the dishwashing machine is decided to be two units and the mechanism that is fixed on the basket. It is possible to provide roller to all end parts of the straight and formed arms of the mechanism and to operate the mechanism by means of the said switch movement, which is the subject of the invention.

## CLAIMS

1. Mechanism for adjusting the dish basket height, characterized by a straight arm (1) consisting of a straight arm movement bearing (17) at the middle and  
5 an oval basket connection shaft bearing (21) on one end and a hollow roller shaft (19) with shaft claws (20) holding the roller (10) around the shaft (19) on the other end.
10. 2. Mechanism for adjusting the dish basket height according to Claim 1, characterized by a formed arm (2) raised from the surface level by means of formed arm steps (27) with both sides, which consists of a cylindrical bearing (15) through the center of which the straight arm (1) will pass, a spring bearing (16) on which the locking button (6) and spring (5) will be fitted, and straight arm connection bearing (14) on the edge of the cylindrical bearing (15); and an oval basket connection shaft bearing (21) on one end and a hollow roller shaft (19) with shaft claws (20) around the shaft (19) on the other end.
15. 3. Mechanism for adjusting the dish basket height according to Claims 1 and 2 characterized by the basket connection shaft (22) that consists of the basket wire bearing (23) and basket connection shaft claw (25) both of which the basket connection wire (13) can be attached, arm bearing (24) engaged into the oval basket connection shaft bearing (21) and that provides the connection of the mechanism to the basket (11).
20. 4. Mechanism for adjusting the dish basket height according to Claim 1 to 3, characterized by the L-shaped hooks (12) formed on the straight (1) and formed (2) arms facing to each other, which prevent the torsion of the arms due to the lateral load on the said arms (1 and 2) by being attached to the  
25 basket.
- 30.

5. Mechanism for adjusting the dish basket height according to claims 1 to 4, characterized by the lock (3) that provides the locking, by passing through the spring bearing (16) and locking spring bearing (26) in such a manner that the spring (5) is left in-between, and which consists of a fixing end (8) and a  
5 fixing end locking form (9) with a locking button spring support (7) on its surface and holds the locking spring (9) located around the locking spring bearing (26) located in the spring bearing (16).
10. Mechanism for adjusting the dish basket height according to Claims 1 to 5, characterized in that a single basket adjusting mechanism can be attached to both sides of the basket (11) without right or left differentiation.
15. Mechanism for adjusting the dish basket height according to Claims 1 to 6, characterized by the straight arm connection bearing (14) formed around the cylindrical bearing (15) on the formed arm (2), so that the locking wedge (4) can be inserted in.
20. Mechanism for adjusting the dish basket height according to Claims 1 to 7, characterized in that the locking spring (5), positioned between the locking spring bearing (26) and spring bearing (16), applies force on the lock (3) and the locking wedge (4) for all positions of locking as it gains initial tension.
25. Mechanism for adjusting the dish basket height according to Claims 1 to 8 characterized in that the mechanism arms (1 and 2) start to open while the basket (11) is raised upwards, the formed arm connection latch (18) pushes and rotates the locking wedge (4) and when the locking wedge (4) comes over the straight arm connection bearing (14), as a result of the spring (5) pulling in the locking wedge (4), it is fitted in the straight arm connection bearing (14) and thus the mechanism is locked.

10. Mechanism for adjusting the dish basket height according to Claims 1 to 9, characterized in that when the basket (11) is desired to be at the lower position, the locking button (6) is pressed, the locking wedge (4) releases the straight arm connection bearing (14), and the mechanism closes due to the weight of the basket (11).  
5
11. Mechanism for adjusting the dish basket height according to Claims 1 to 10, characterized by the formed arm steps (27) that is raised as compared to the surface of the formed arm (2).

FIGURE 1

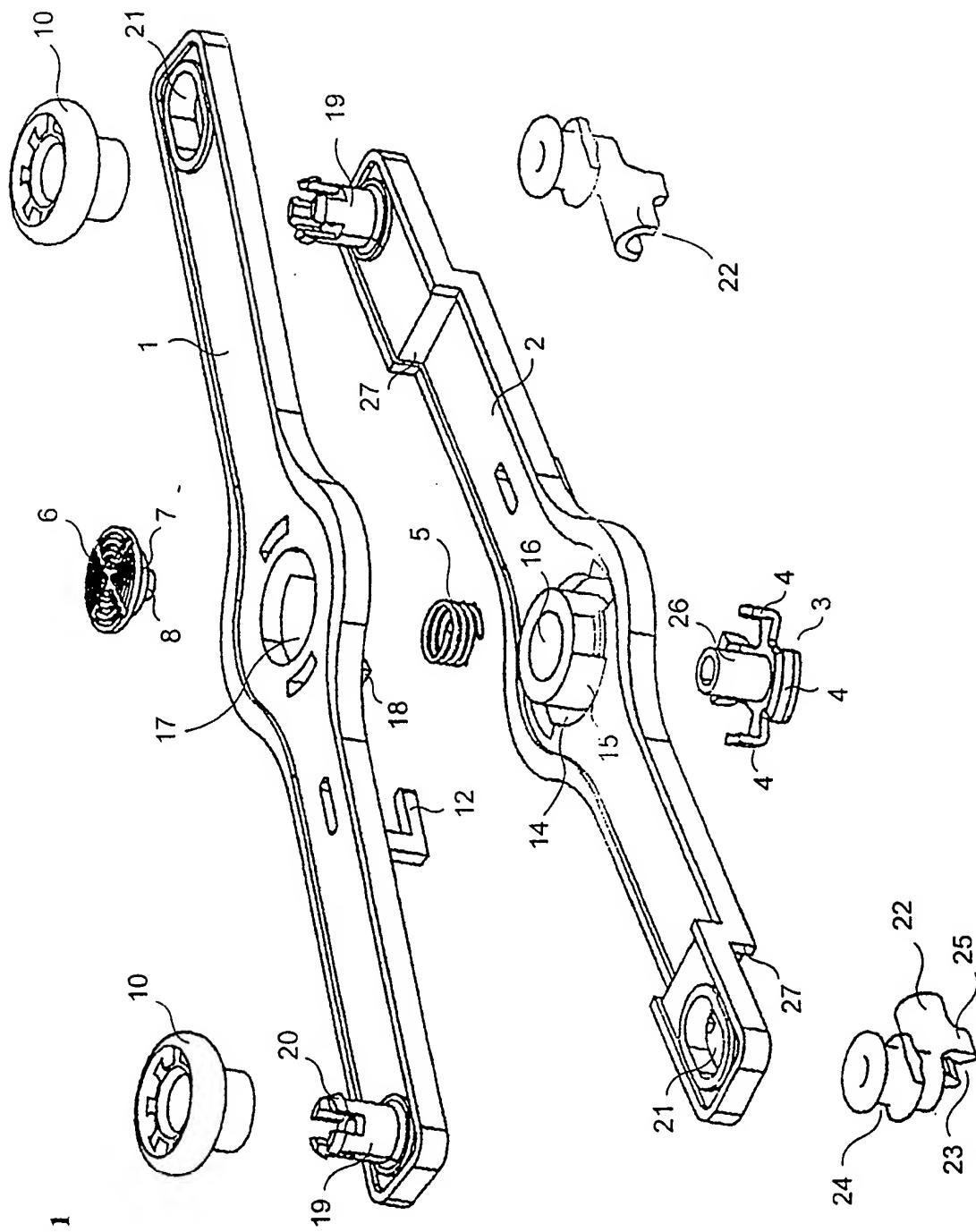


FIGURE 2A

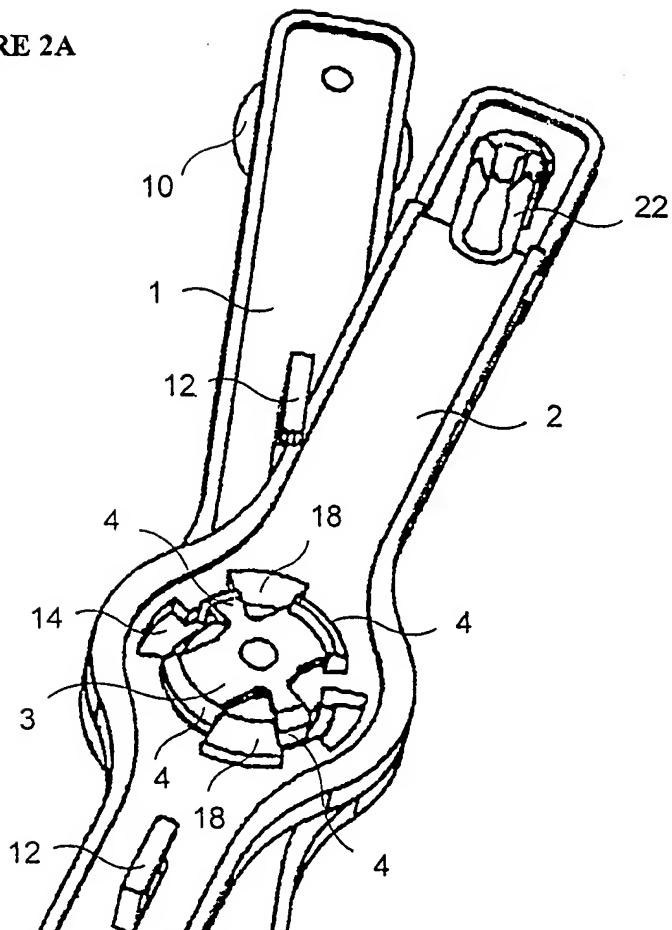


FIGURE 2B

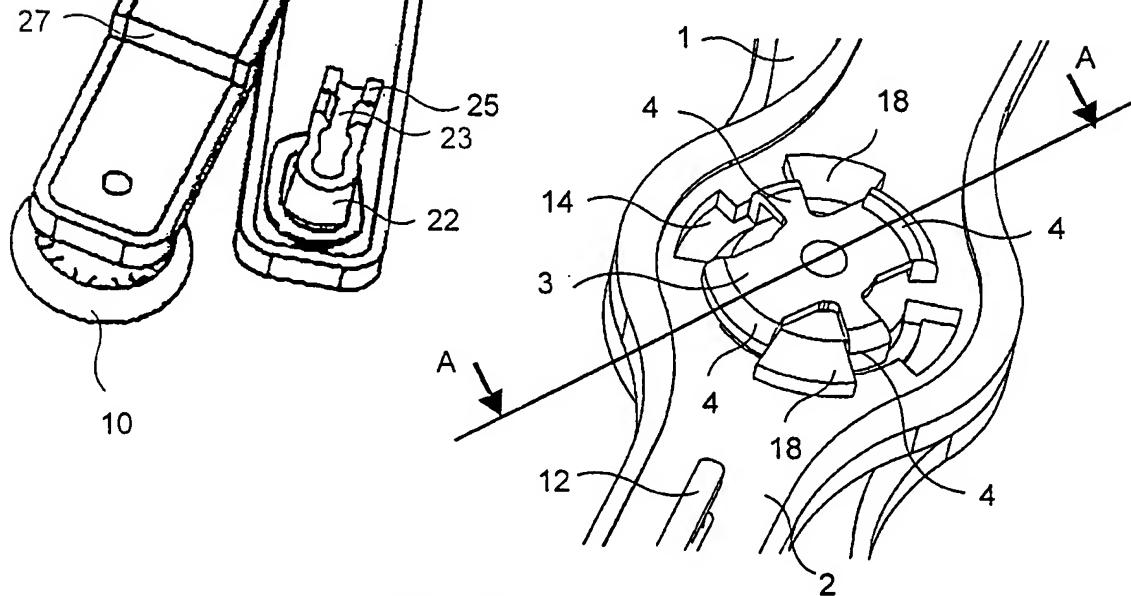


FIGURE 3A

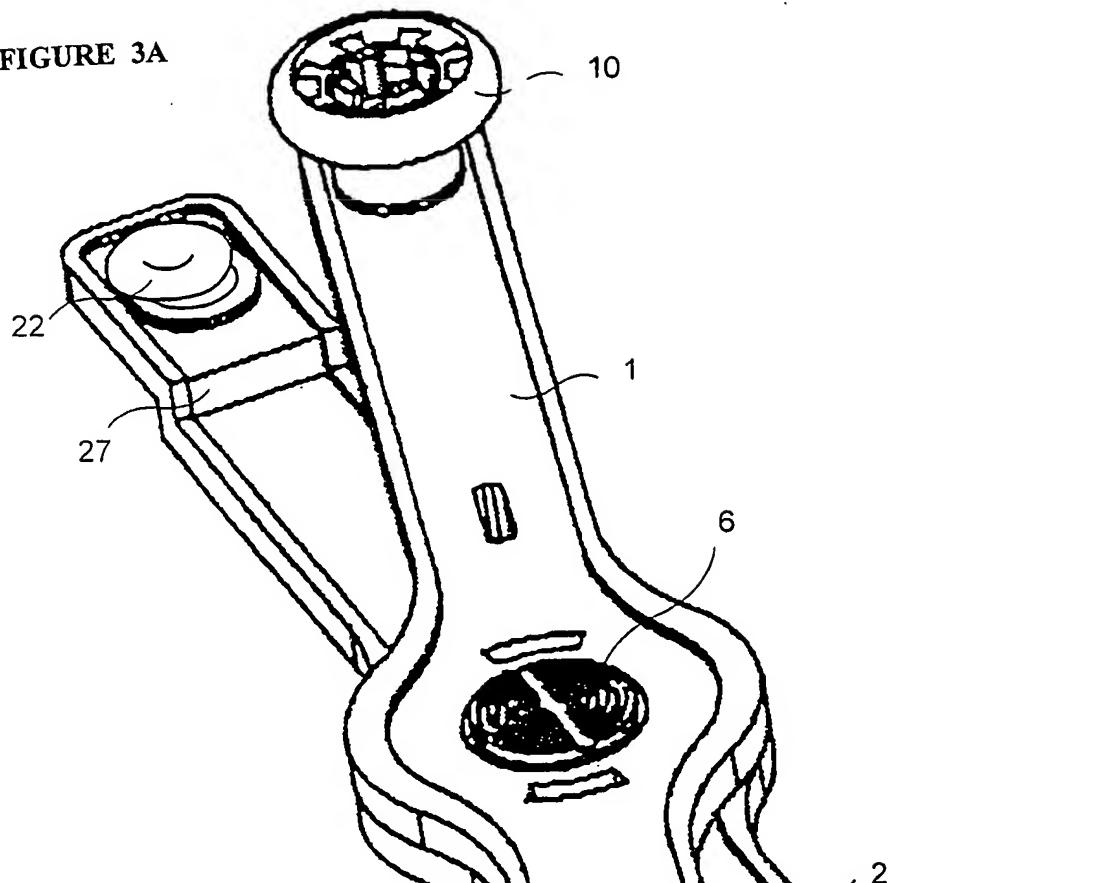
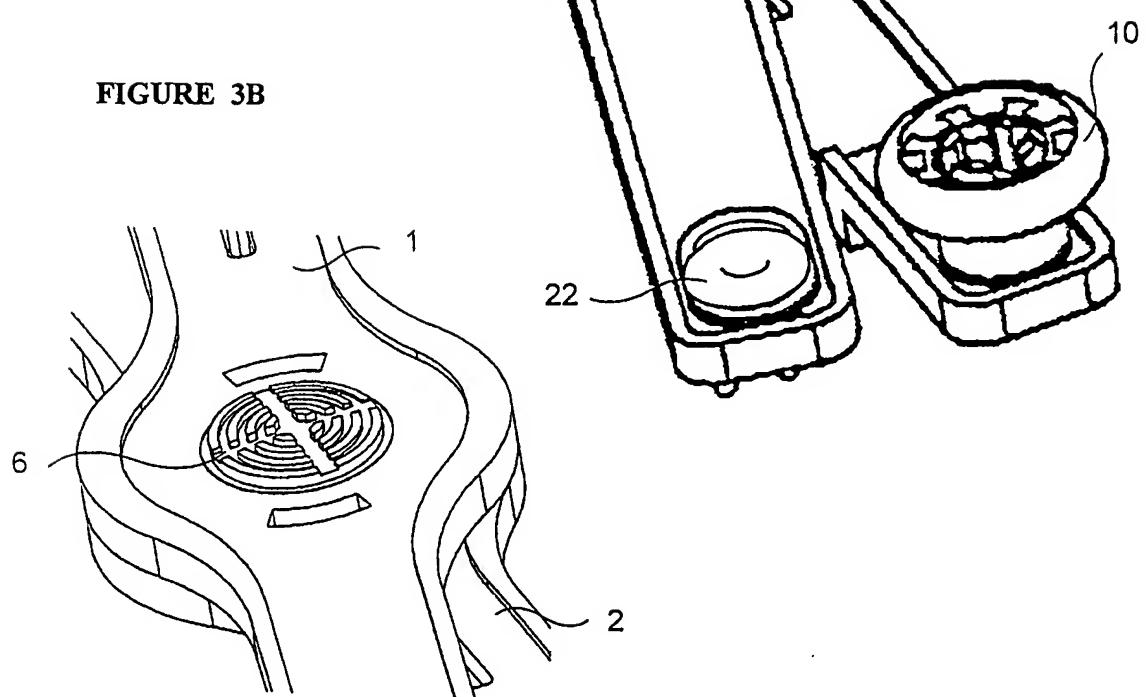
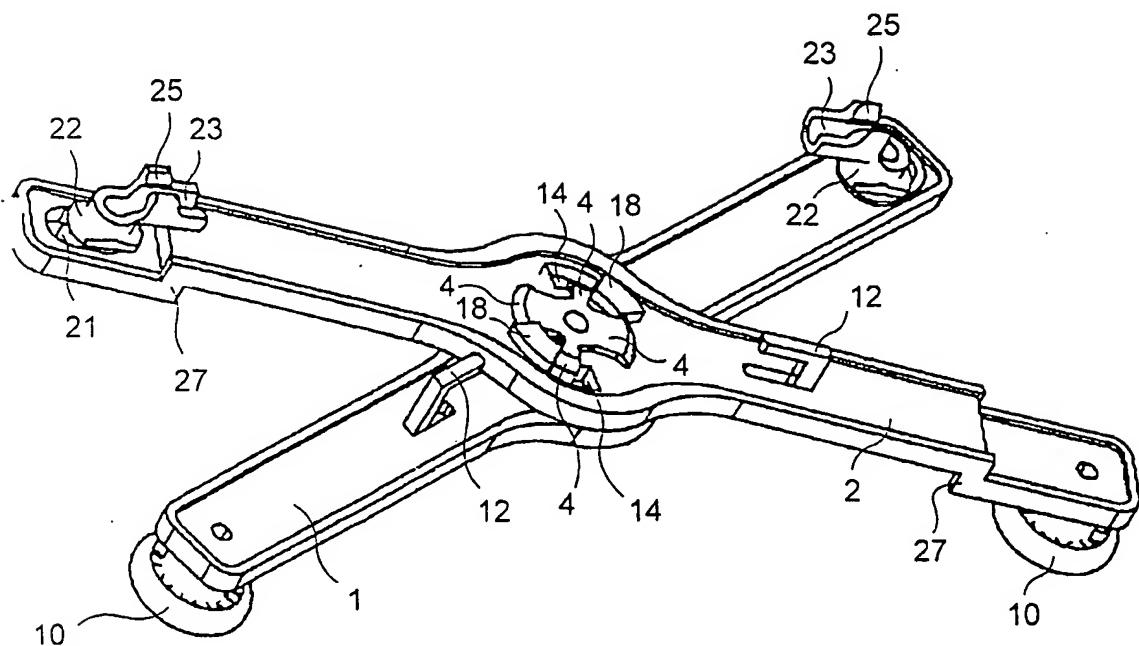
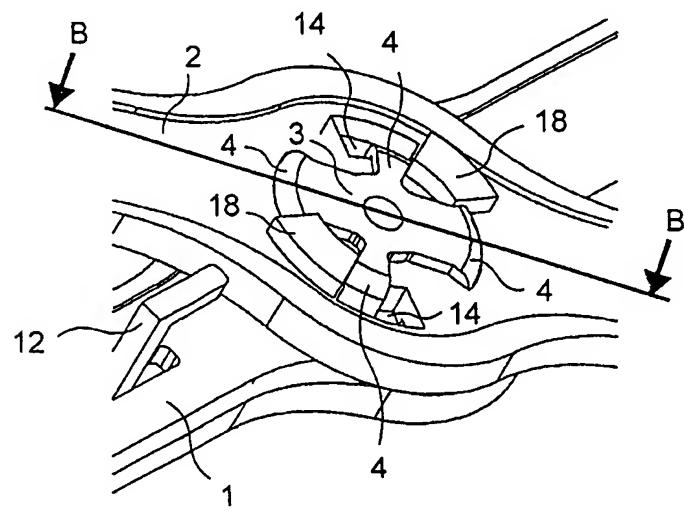


FIGURE 3B



**FIGURE 4A****FIGURE 4B**

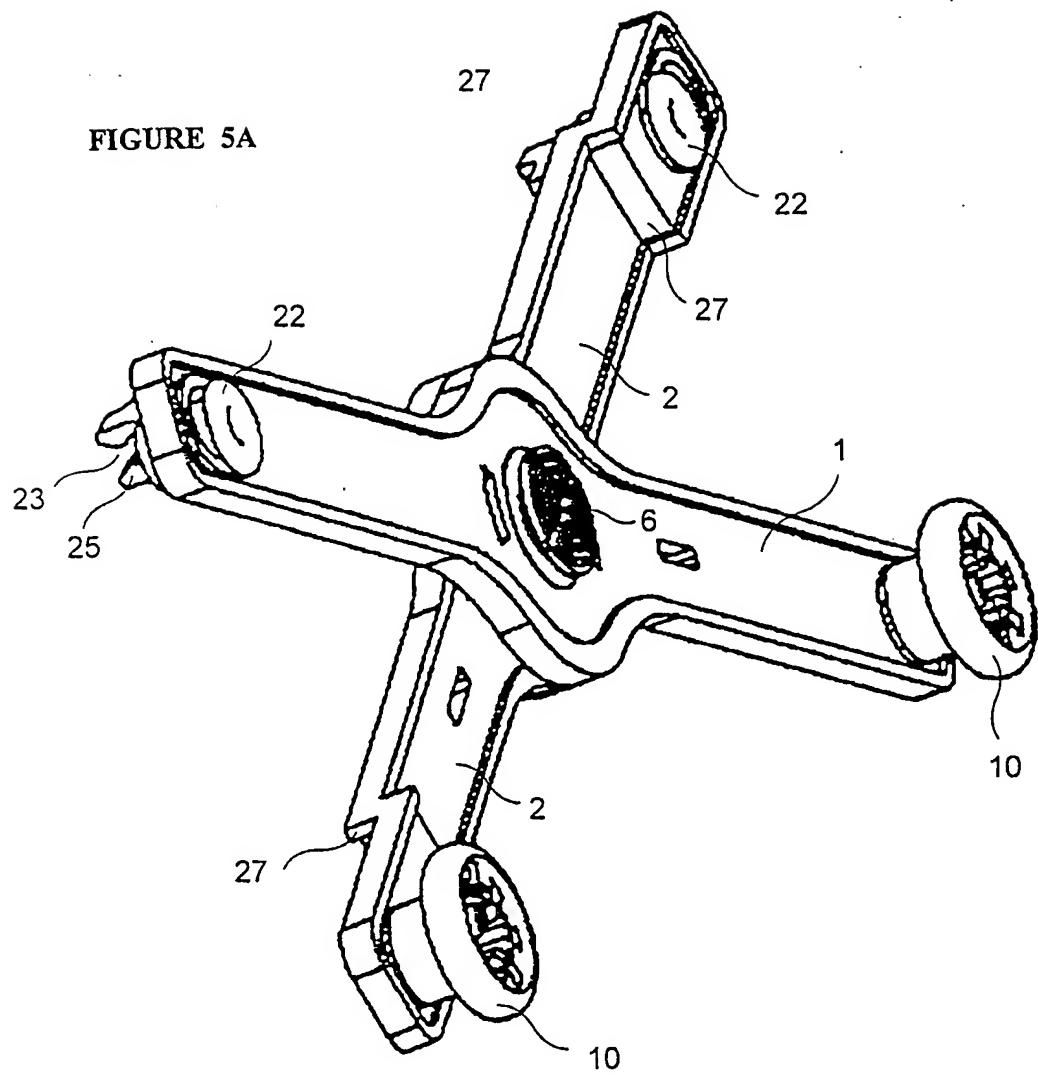
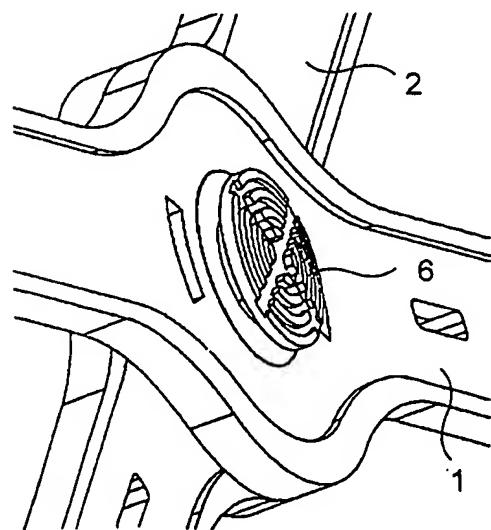
**FIGURE 5A****FIGURE 5B**

FIGURE 6

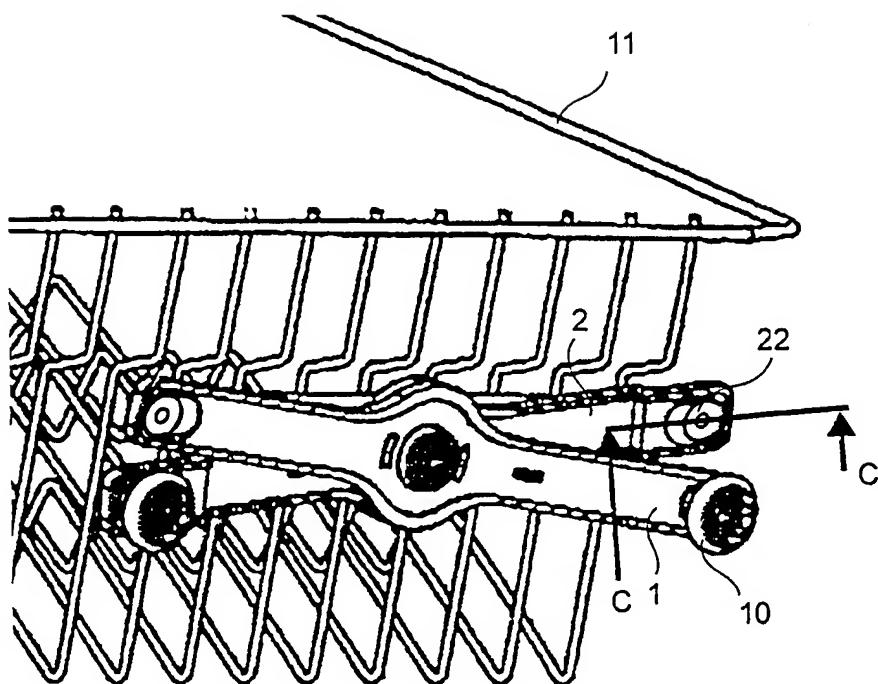
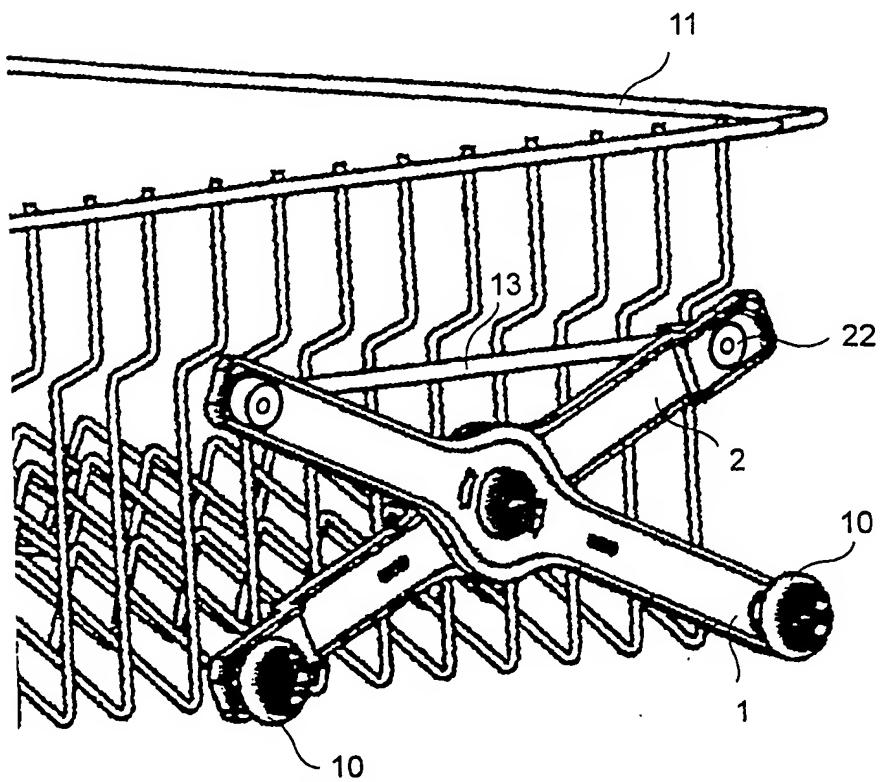
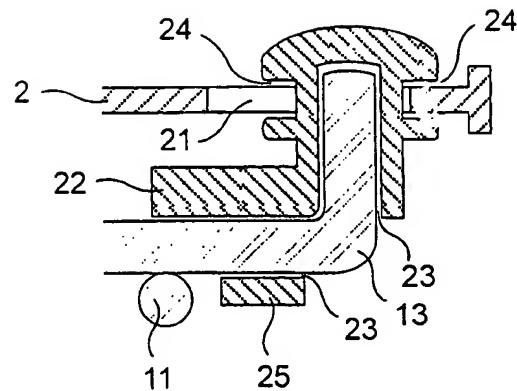
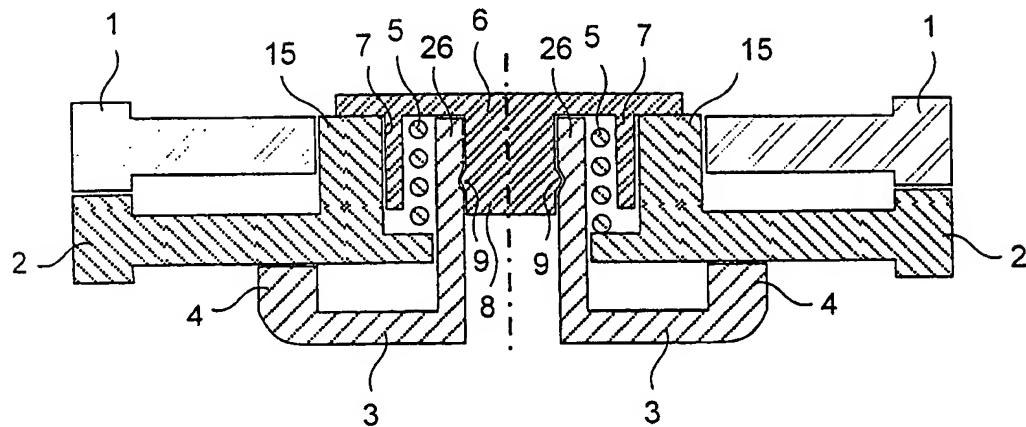
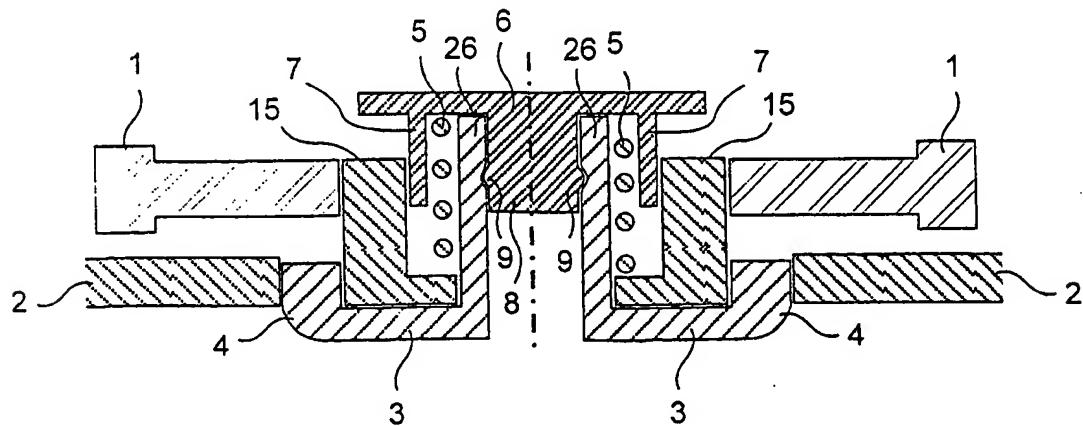


FIGURE 7



**FIGURE 8****FIGURE 9A****FIGURE 9B**

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/TR 00/00009

## A. CLASSIFICATION OF SUBJECT MATTER

IPC<sup>7</sup>: A 47 L 15/50

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC<sup>7</sup>: A 47 L 15/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

epodoc

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5860716 A (GOOD et al.), 19 January 1999 (19.01.99), fig.5.	1
A	DE 2733090 A1 (HOBART), 02 February 1978 (02.02.78), fig.10.	1-3
A	EP 0901770 A2 (ELECTROLUX), 17 March 1999 (17.03.99), fig.1.	1
	-----	

Further documents are listed in the continuation of Box C.

See patent family annex.

- \* Special categories of cited documents:  
 „A“ document defining the general state of the art which is not considered to be of particular relevance  
 „E“ earlier application or patent but published on or after the international filing date  
 „L“ document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)  
 „O“ document referring to an oral disclosure, use, exhibition or other means  
 „P“ document published prior to the international filing date but later than the priority date claimed
- „T“ later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention  
 „X“ document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone  
 „Y“ document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art  
 „&“ document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 June 2000 (30.06.00)	24 July 2000 (24.07.00)
Name and mailing address of the ISA/AT Austrian Patent Office Kohlmarkt 8-10; A-1014 Vienna Facsimile No. 1/53424/200	Authorized officer  Baburek  Telephone No. 1/53424/352

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
**PCT/TR 00/00009**

Patent document cited in search report				Publication date		Patent family member(s)		Publication date	
US	A	5860716		19-01-1999		none			
DE	A1	2733090		02-02-1978		CA	A1 1091546	16-12-1980	
						FR	A1 2359593	24-02-1978	
						GB	A 1595592	12-08-1981	
						US	A 4064887	27-12-1977	
EP	A2	901770		17-03-1999		EP	A2 887605	30-12-1998	
EP	A3	901770		19-05-1999		EP	A3 887605	13-10-1999	
						IT	A0 970037	24-06-1997	
						IT	A1 970037	24-12-1998	
						IT	B1 1294136	22-03-1999	